

Appl No.:10/643,063

Atty. Dkt.: UCF-372

Amendment to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Currently amended). A thin film transistor liquid crystal display having fast response and wide viewing angle, comprising:

a first substrate with a continuous first common electrode layer;

a second substrate with both a continuous pixel electrode layer and a discontinuous second common electrode layer located above the continuous pixel electrode, wherein the discontinuous second common electrode layer includes plural second common electrodes having a gap between adjacent second common electrodes;

liquid crystal between the first substrate and the second substrate; and

means for generating an electric field between the first common electrode layer in the first substrate and both the continuous pixel electrode layer and the discontinuous second common electrode layer in the second substrate by applying different a first voltage to the continuous first common electrode layer and a second voltage not equal to the first voltage applied to the discontinuous second common electrode layer to generate the electric field between the first common electrode layer on the first substrate and both the continuous pixel electrode layer and the discontinuous second common electrode layer in the second substrate so that the display provides fast response to high input data rates and allows for wide viewing angles for viewers.

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Claim 2 (Previously presented). The display of claim 1, wherein the electric field generating means has:

the discontinuous second common electrode layer separated from the pixel electrode layer by an insulation layer in the second substrate.

Claims 3-4 (Cancelled).

Claim 5 (Previously presented). The display of claim 1, further comprising:
means for supplying a voltage source to the continuous pixel electrode layer.

Claims 6 (Cancelled).

Claim 7 (Currently amended). The display of claim 1 claim 3, wherein the first voltage applied to the continuous first common electrode is higher than the second voltage applied to the discontinuous second common electrode layer.

Claim 8 (Currently amended). The display of claim 1 claim 3, wherein the second voltage applied to the discontinuous second common electrode layer is higher than the first voltage applied to the continuous first common electrode layer.

Claim 9 (Cancelled).

Claim 10 (Previously presented). The display of claim 2, further comprising:

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a dielectric layer adjacent to the continuous first common electrode to increase a lateral field strength in an upper portion of the liquid crystal to improve a light efficiency of the thin film transistor liquid crystal display.

Claim 11 (Previously presented). The display of claim 8, wherein a third voltage applied to the continuous pixel electrode layer is equal to the first voltage to generate a non-vertical electric field.

Claim 12 (Previously presented). The display of claim 7, wherein a third voltage applied to the continuous pixel electrode layer is equal to the second voltage to generate a vertical electric field.

Claim 13 (Currently amended). A method of providing fast response and wide viewing angle to thin film transistor liquid crystals displays, comprising the steps of:

providing a liquid crystal layer between a first substrate and a second substrate; and

generating an electric field in the liquid crystal layer between the first and second substrates, wherein a first voltage is applied to a continuous first common electrode layer on the first substrate, and a second different voltage not equal to the first voltage is applied to a discontinuous second common electrode layer having plural spaced apart second common electrodes on the second substrate and applying a third voltage to a pixel electrode layer positioned below the discontinuous second common electrode on the second substrate for fast responses to input data and wide viewing angles for viewers.

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Claim 14 (Previously presented). The method of claim 13, wherein the step of generating an electric field includes the step of:

applying the third voltage to the pixel electrode layer that is approximately equal to the second voltage of the discontinuous second common electrode layer, wherein the pixel electrode layer is continuous and the equal voltage generates a uniform, vertical electric field.

Claim 15 (Previously presented). The method of claim 13, wherein the step of generating an electric field includes the step of:

applying the third voltage to the pixel electrode layer, wherein the third voltage is unequal to the second voltage in the discontinuous second common electrode layer so that a non-vertical electric field occurs.

Claim 16 (Previously presented). The method of claim 15, wherein the step of generating a non-vertical electric field includes the step of:

forming a discontinuous pixel electrode layer having plural spaced apart pixel electrodes alternating with the plural spaced apart second common electrodes so that each one of the plural pixel electrodes is adjacent to one of the plural second common electrodes in the same plane; and

forming a resistive layer between the discontinuous pixel electrode layer and the discontinuous second common electrode layer, wherein the discontinuous pixel electrode

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layer and alternating adjacent discontinuous second common electrode layer are adjacent to the liquid crystal layer; and

applying the third voltage to the discontinuous pixel electrode layer that is equal to the second voltage so that a horizontal electric field is generated between the discontinuous pixel electrode layer and the discontinuous second common electrode layer so that a longer lateral electric field occurs.

Claim 17 (Cancelled).

Claim 18 (Previously presented). The method of claim 13, wherein the third voltage applied to the pixel electrode depends on the input data to generate a vertical electric field when the input data is high and a non-vertical field when the input data is low.

Claim 19 (Currently amended). A thin film transistor liquid crystal display having fast response and wide viewing angle, comprising:

a first substrate with a continuous first common electrode layer;
a second substrate with both a discontinuous pixel electrode layer having plural spaced apart pixel electrodes and a discontinuous second common electrode layer having plural spaced apart second common electrodes, wherein the each one of the plural pixel electrodes alternates with an adjacent one of the plural common electrodes in the same plane and having a gap therebetween;

liquid crystal between the first substrate and the second substrate; and
means for generating an electric field between the first and second substrate by applying a first voltage to the continuous first common electrode layer and applying a

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different-second voltage not equal to the first voltage to the discontinuous second common electrode layer so that the display provides fast response to high input data rates and allows for wide viewing angles for viewers.

Claim 20 (Previously presented). The display of claim 19, wherein the electric field generation means further comprises:

applying the first voltage to the discontinuous pixel electrode to produce a lateral field between the discontinuous pixel electrode layer and the discontinuous second common electrode layer to switch liquid crystal molecules during a bright state.